4-1691

Information Concerning Vegetation Collected as Biological Reference Material for Uranium and Radionuclides

In accord with conditions specified in contract number 0S084-00114, early in September 1984 204 kg of needles and twigs of black spruce, Picea mariana (Mill.) B.S.P., were collected from the vicinity of Cluff Lake, northwestern Saskatchewan (Fig. 1). Three sample sites were selected (Fig. 2), and the material divided into four categories which were labelled on the boxes sent to Ottawa as site 1, site 2, site 3A and site 3B. Details of this material are as follows:

Site 1 - 6 boxes (about 120 kg) of fresh needles and twigs of black spruce.

This material was collected from a site approximately 50 m from the current edge of the Cluff Lake tailings pond, in an area where solid silty radioactive waste was dumped at the end of August,1984. A scintillometer reading taken on September 7th recorded a background radiation of 80 cps, with about 800 cps over the radioactive waste. The radioactive waste covered part of the surface of the muskeg in which the sampled trees were growing.

Site 2 - 5 boxes (about 16 kg) of dry twigs from dead black spruce.

This material was collected from a site where trees are drowned by radioactive waters from the tailings pond. Tree death was probably caused by drowning in 1981 rather than by radiation damage. Two samples collected by the writer from this site in 1981 yielded 1480 ppm U and 1120 ppm U in the ash of the outermost 10 years of twig growth. This corresponds to about 30 and 22 ppm U, respectively, in dry material. It is anticipated that this material has the highest U and radionuclide content.

Site 3 - 3A - 3 boxes of fresh twigs and needles (about 60 kg);
3B - 2 boxes of dry twigs (about 8 kg).

All material was from about 100 m south of the worked-out 'D' zone of uranium mineralization. A forest fire ravaged this area in 1981, hence few live trees remained for sampling. Black spruce twigs collected by the writer in 1983 returned values of 500 ppm U in their ash (equivalent to about 10 ppm U in dry material). This is a natural, non-anthropogenic, U content.

FEB 27 1985
MICROMEDIA

The U content of the twigs is generally much higher (up to an order of magnitude in ashed material) than that of the needles. You may, therefore, wish to separate needles from twigs (after drying) in order to obtain reference material for both plant organs.

Dry twigs were collected because they represent the equivalent of a much greater weight of fresh twigs plus needles. For example, 100 kg of fresh twigs and needles generate only 10 kg of dry twig.

Colin E. Dunn, Ph.D., P.Eng.
16 September 1984.

MAPS NOT

FILMED

CARTES

OMISES

POOR

QUALITY

ORIGINAL